should serve in the Royal Army Medical Corps. It may be hoped that students of similar standing, who have qualified themselves in various branches of science and technology, will be found suitable places in other branches of the Services, where their special knowledge will be used to the best national advantage.

THE appeal issued last July from the Office of the Board of Education for books to supply the needs of the 4000 or more British civilian prisoners interned in the concentration camp at Ruhleben in Germany met with a hearty response. More than 2000 volumes, mostly standard works, were contributed, and forwarded to Ruhleben. A second appeal has now been received from the camp for more books, and in giving publicity to it the Board of Education desires to thank all those who responded to the original request, whether for offers of books or of money. Under the auspices of a Camp Education Department a school and a science and art union have been organised at Ruhleben, which now have numerous classes, and some 150 lecturers and teachers, and 1500 students, divided into nine departments, which include two in engineering, and one each in mathematics and science, elementary physics, and navigation. The necessary funds for the educational work carried on at Ruhleben are raised by voluntary contributions among the prisoners themselves, and no prisoner is debarred by lack of funds from sharing in the advantages of the camp school. In responding to the appeal for additional books of an educational character it is requested that intending donors will, in the first instance, fill up and return a form which will be supplied on application. A careful selection will then be made, and notified to the donor, of the books suitable for despatch (through the Board of Education) to Germany, so as to comply with the very strict regulations which govern the transmission of literature to the camp. All communications on the subject should be addressed to Mr. Alfred T. Davies, Board of Education, Whitehall, London, S.W. Envelopes should have the word "Ruhleben" written in the left-hand corner.

THE confident prediction in our note last week on the articles in recent issues of the *Morning Post* on British universities and the call to arms, that when particulars of other than English universities were forthcoming it would be found that a similar satisfactory response had been made by Wales, Scotland, and so on, is borne out by the third article published by our contemporary on November 23. Taking the three constituent colleges of the University of Wales, the article shows that Bangor has about 230 students serving, and that five have been killed; that Aberystwyth has 284 in the forces, and that eleven have been killed or are among the missing; and that Cardiff has about 285 serving. One of the inevitable effects of the flocking of the students to the Colours has been a decrease in the number of candidates for examinations. Thus, while in June, 1914, the candidates for initial degrees numbered 1017, the number fell this year to 790. Generally speaking, the decrease in the attendance at the Scottish universities since the outbreak of the war, though very marked, has not been as large as in some of the English centres of learning. In the case of the University of Edinburgh, up to July 8, when an edition of the roll of honour was published, 853 students were known to be serving with the Colours, besides 2562 graduates and alumni; 62 had lost their lives, and 87 had been wounded. It was recently estimated that 1500 old students and 600 present students of the University of Glasgow were serving with the forces. About fifty are believed to have been killed, and many wounded. Apart from these, about 300 are engaged in munitions work. A number of senior medical students who have been invalided are returning to finish their course at the University, having been specially advised to do so. About 280 students of Aberdeen University are serving with the forces. The casualties at the end of September numbered 15 killed and 38 wounded. Of the graduates, alumni, and students of the University, more than 1300 are on naval and military service, and about 110 are under military training. The response from St. Andrews University has also been satisfactory. The writer of the article had received insufficient information to enable him to deal in detail with Irish universities.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, November 25.—Sir William Crookes, president, in the chair.—M. **Flack**, O. W. **Griffith**, and L. **Hill**: The measurement of the rate of heat loss at body temperature by convection, radiation, and evaporation. An investigation of the rate of cooling of a surface at body temperature (1) dry, (2) wet, under varying conditions of atmosphere, with the view of elucidating the effects of climate, and of heating and ventilation of rooms on health and comfort. A large-bulbed spirit thermometer is employed of standard pattern—the Kata thermometer; methods of calibrating have been worked out, and a factor determined for each, so that the rate of cooling can be expressed in milli-calories per sq. cm. per sec. Some thousands of observations have been made in still air under varying conditions, and the cooling curves plotted; the theory of cooling detailed is the work of the late O. W. Griffith. Experimental results, independently obtained, agree with theory.—E. W. A. **Walker**: The growth of the body in man. The relationship between the body-weight and the body-length (stem-length). Observations have been made on infants, children, and young persons up to early adult age in order to determine whether any definite relationship could be shown to exist between the body-weight and the body-length. By the term body-length is meant the stem-length measured from the top of the head to the line joining the ischial tuberosities. This measurement corresponds to the body-length in animals, and was chosen in order that results obtained for man might be brought into comparison with those for other animals. The author finds that throughout the period of growth stem-length in man can correctly be expressed as a function of body-weight, and conforms to the formula, $l=k.\bar{w}^n$; where l is stem-length, w weight, k a constant, and n a power of approximate value $\frac{1}{3}$. For the male the value of n (to two places of decimals) is 0·33, for the female it is 0·32. If the stem-length differ by as much as 16·5 per cent. from the value calculated from the body-weight by means of the appropriate formula, the individual may be regarded as abnormal.—Prof. A. J. **Brown** and F. **Tinker**: The rate of absorption of various phenolic solutions by seeds of *Hordeum vulgare*, and the factors governing the rate of diffusion of aqueous solutions across semi-permeable membranes. It has been pointed out previously that the seeds of Hordeum (barley) are enclosed by a membrane which exhibits the exceptional property of differential permeability. When the dry seeds are immersed in aqueous solutions of most inorganic acids and salts, sugars, etc., water alone passes through their containing membrane; with other classes of solutes, however, such as the phenols, fatty acids, and monohydric alcohols, the solute enters the seeds together with water. In order to learn something of the physical properties which presumably govern the exhibition of differential permeability (only recognised to a marked extent with living protoplasm and with the coverings of certain seeds), experiments have been made with a series of closely-related organic solutes, viz., phenol, catechol, resorcinol, quinol, and pyrogallol, all of which enter the seeds of Hordeum when in aqueous solution. Experiment appears to justify the conclusion that when the temperatures, osmotic pressures, vapour pressures, and viscosities of a series of solutions of *permeable* solutes are equal, their rates of diffusion across the seed-membrane are inversely proportional to their surface tensions.—F. **Kidd**: The controlling influence of carbonic dioxide. III.—The retarding effect of carbon dioxide on respiration. Researches previously described led to the conclusion that the resting stage of the moist seed is primarily a phase of auto-narcosis induced by tissue CO_2. Inhibition of germination by CO_2 was demonstrated in the laboratory and in the field under a wide range of conditions. *Inter alia,* it was shown that the inhibitory value of a given carbon dioxide pressure diminishes with a rise of oxygen pressure and also with a rise of temperature. These researches have now been carried further to determine if possible the mechanism CO_2-narcosis. The present paper deals with the effect of CO_2 upon the respiratory function. The outstanding result shown is that CO_2 causes a marked retardation of respiration.

Physical Society, November 12.—Dr. A. Russell, vice-president, in the chair.—Prof. J. A. **Fleming** and P. R. **Coursey**: The effect of electric oscillations on the magnegtic properties of iron, investigated by the campograph. In March last Prof. Fleming exhibited the campograph, for photographing and delineating physical curves. Since then the optical arrangements have been improved, and the effect of electric oscillations on the hysteresis and permeability of iron have been investigated with the improved instrument. When an iron wire is taken slowly through a magnetic cycle and a superposed high-frequency magnetising force is also applied, then, if the maximum value of the slowly periodic longitudinal magnetic force does not exceed a certain value, the effect of the oscillations is to increase the area of the hysteresis loop and to increase the magnetisation at the ends of the cycle. If the slowly periodic force has a large maximum value then the hysteresis loop is diminished in area, but the maximum magnetisation remains unaltered. The increase in area of the hysteresis loop is generally less for high frequency than for low frequency oscillations, because in the latter case the oscillatory flux penetrates further into the iron wire. If oscillatory currents are passed along the iron wire whilst at the same time the iron is taken slowly through a longitudinal magnetic cycle with continuous current, then when the oscillatory current has a small R.M.S. value the effects are generally similar to those produced by longitudinal oscillatory magnetic forces. If the oscillatory current is relatively large then their effect is to reduce the hysteresis and magnetisation at the ends of the cycle. This last action is due to the circular magnetisation produced by the longitudinal current, which grips the magnetic molecules of the iron, and prevents their longitudinal colineation and reduces also the hysteresis. The same effect is seen when a longitudinal continuous current is passed along an iron wire. The effect of superimposing on a steady feeble longitudinal magnetic force an alternating magnetic force either by undamped or damped oscillations is greatly to increase the permeability at the ends of the cycle, provided the oscillatory force does not exceed a certain value. Beyond that a diminution sets in.

Royal Anthropological Institute, November 16.—Prof. A. Keith, president, in the chair.—Prof. H. J. **Fleure**: An anthropological analysis of the people of Wales. This paper embodied work by Dr. T. C. James and the author during the past ten years. Remote country districts were selected, and altogether 2500 natives of these districts were examined, thirty points being noted and tabulated for each individual. The results were plotted out on maps, so that the physical characters of the native of each district could be detected at a glance. Centres of dark dolichocephalic people were found around Mynydd Hiraethog, S. Cardiganshire, and in the hill country of Glamorgan and Monmouth. These and other centres were afterwards found to be near prehistoric centres of settlement. A very primitive type was found in the Plynlymon moorland, a poor, isolated district, the head form of this type being homologised with the Blackwater skull type. A type, apparently related to the round-barrow man, but with softened features, is characteristic of the valley cleft from Bala to Towyn and of its branches. It is very distinct physically and psychically from other Welsh types. In districts on the coast, with a pelagic climate, and usually near megalithic remains, is found a dark brachycephalic type, with strong jaws. This may be the "old black breed" found in the Shetlands. There is evidence of a chain of localities occupied by people of this type, extending from S.W. Norway (Arbo) along the shores of the Irish Sea, Brittany, Spain, Italy, to the eastern Mediterranean. This line was considered to be connected with a trade route of the Bronze age. Nordic types, amongst Welsh natives, were noted in certain estuaries and open coast localities, and the possibility of Irish Nordic types being represented in mid-Cardiganshire was discussed. To explain the distribution of Neolithic and other types in Wales, Prof. Fleure maintained that the Neolithic inhabitants had occupied only the higher lying, wind-swept moorlands, and that the thickly wooded river valleys served as barriers to migrating peoples.

Geological Society, November 17.—Dr. A. Smith Woodward, president, in the chair.—J. **Parkinson**: Some observations on the structure of the northern frontier district and Jubaland Provinces of the East Africa Protectorate. A floor of gneisses and schists is overlain on the western side by lavas, including those arising from the volcanoes Kulal, Assi, Hurri, Marsabit, etc., and by probably older lava-fields which together extend as far as long. 39° E. On the south, it was found that the lavas north of Kenya reached the Guaso Nyiro, but that a high gneiss country extended north-westwards from lat. 1° N. and long. 38° E. to within a short distance of Lake Rudolf. Eastwards the coastal belt of sediments proved to be of Upper Oxfordian age and to extend to long. 40½° E., and these were lost southwards under the great alluvial plain of Jubaland. At intervals throughout the alluvial plain disconnected exposures were found of soft calcareous sandstones or limestones, the age of which cannot now be definitely fixed. Evidences of the desiccation of the country were shown (1) by the laks, or water-channels, characteristic of Jubaland, which contained surface-water only during the rainy season and then extremely rarely, if ever, throughout their length; (2) by the presence of fresh-water molluscs in the scarcely consolidated beds of such laks and at other places where now no surface-water is present; and (3) by the presence of wells along fault-lines and in other places where, but for the previous presence of springs, it appears improbable that the natives would have begun sinking.

Linnean Society, November 18.—Prof. E. B. Poulton, president, in the chair.—Dr. E. J. **Salisbury**: Photographic studies of Welsh vegetation. The subject was dealt with under the following heads:—(1) The vegetation of the limestone: (*a*) the limestone cliffs; (*b*) limestone pasture, with the dominant species, *Festuca ovina,* accompanied by many of the common chalk-down species. Locally small woods of *Quercus sessiliflora* occur, though usually confined to siliceous soils. (2) The vegetation of the siliceous soils: (*a*) the *Quercus sessiliflora* woods, with associated trees as Betula spp. and *Pyrus aucuparia.* Where the water-content is high, but the soil not acid, Fraxinus becomes common. As a result of felling or exposure *Betula pubescens* may become the dominant tree. The average light-intensity in summer is about 7·6 per cent. of the maximum diffuse illumination outside. The shrub layer is usually poor. The flora of the drier parts largely consists of heath species; in the wetter and more acid parts, *Vaccinium myrtillus* is often abundant; towards the base of the slopes the ground flora is often almost entirely cryptogamic. Epiphytes as *Polypodium vulgar, Frullania* spp., and lichens are often abundant. In the valley bottom the *Quercus sessiliflora* woods merge into Alnus woods, with a light-intensity of about 3 per cent or under. (*b*) Scrub chiefly of Cratægus. (3) The subalpine vegetation: (*a*) the subalpine lakes with *Subularia aquatica, Lobelia dortmanna, Littorella lacustris,* and *Isoëtes,* with absence of marginal vegetation; (*b*) the subalpine pastures (Nardus, Lycopodium spp., etc.).

Zoological Society, November 23.—Dr. A. Smith Woodward, vice-president, in the chair.—Prof. A. **Dendy**: Land-planarians from West Australia and Tasmania. The collection was made by members of the British Association. Three species were obtained in West Australia, all of which proved to be new, and of six species collected in Tasmania, two were described as new.—G. A. **Boulenger**: Snakes of East Africa and Nyassaland, and of north-east Africa and Socotra. Lists were given, with keys to the identification of the genera and species.—G. A. **Boulenger**: A new Amphisbæna and a new snake discovered by Dr. H. G. F. Spurrell in southern Columbia.—C. Tate **Regan**: The morphology of the Cyprinodont fishes of the subfamily Phallostethinæ. The author described the structure of these extraordinary little fishes from Johore, and particularly the differences in the priapium of the two genera he recognised.

Calcutta.

Asiatic Society of Bengal, November 3.—H. G. **Graves**: The invention of fire. An endeavour to trace the stages of the "inventive" power of man by which fire was converted to his use. The first advance consisted in the maintenance of a fire by feeding it with fuel; next came the power of carrying fire from place to place, and then followed the ability to originate fire. The subject is treated in view of the very low mental powers of early man. With analogies drawn from the development in the manufacture of matches, which originated less than a century ago, it is shown how difficult it is to apply the inventive faculties, and afterwards how easy it is to minimise the importance of any past advance in view of knowledge at the moment.—S. C. **Mitra**: Demon-cultus in Mūndāri children's games. The theory is discussed that a goodly number of European children's games and a few North Indian games, of the well-known "blind man's buff" type, are survivals of demon-worship. It has been suggested that the blindfolded player represents the masked demon who tries to catch the rest of the players, while the latter try to evade being caught. The mask was unprovided with eyeholes either for making the catching more difficult or for warding off the "evil eye" of the demon during the imitation of his activities. It is urged that the demon's attempt to catch the rest of the players and the latter's evasion of his efforts to seize them cannot certainly be called relics of demon-worship. It is suggested that the games are not survivals of demon-worship, but embody vestiges of the demon-lore of primitive times. There appears to be only one game—the "Jack-fruit game," played by children among the Mūndās of Chhota Nagpore—which embodies a travesty of demon-worship.

Cape Town.

Royal Society of South Africa, October 20.—Dr. L. Péringuey, president, in the chair.—E. J. **Goddard** and C. S. **Grobbelaar**: Description of a South African species of Pelodrilus. This is the first record of the genus Pelodrilus in South Africa. The specimens were obtained from Sneeuw Kop, near Wellington, at a height of about 4500 ft. The genital pores were distinctly made out. The occurrence in South Africa is interesting, as the genus has a distribution restricted to the Antarctic region.—S. H. **Haughton**: Preliminary note on ancient human skull remains from the Transvaal. A description of the skull remains found at Boskop, Transvaal, and of the manner of their occurrence. The remains consist of the greater part of the skull-cap, a temporal bone, and a portion of the lower jaw. No estimate can be given as to their age. The bones are fossilised, and were found embedded in a subsoil which overlay and partially consisted of the lateritic "ouklip" characteristic of some parts of the Transvaal. The skull-cap is the longest known, with the exception of that of La Chapelle-aux-Saints. Its greatest affinities are with the skulls of the Cro-Magnon type—a Negroid type which lived in southern Europe after that of Neanderthal. The back of the skull is elongate, a feature displayed both by the Neanderthal man and the Cro-Magnon man, while the forehead and anterior half of the skull agree with the Cro-Magnon and Bantu types, and not at all with the Neanderthal. The temporal bone is primitive in its characters, and seems to indicate a more degraded type than does the skull-cap, a semblance which may be due to sex. The lower jaw is small and akin in character to that of the Bantu or Bushman type. Fragments of limb-bones found in the neighbourhood of the skull-cap are described as human.—A. N. **Henderson**: The elastic arch continuous over several spans, capable only of small rotary motions at the supports.—H. **Bohle**: The heating coefficients of rheostats and the calculation of resistances for currents of short and moderate duration.—J. C. **Beattie**: Further magnetic observations in South Africa during the years 1914–15. The declination, dip, and horizontal intensity are given for twenty-seven stations, including two repeat stations in the Free State, Transvaal, and Cape provinces.—J. C. **Beattie**: True isogonics and isoclinals for South Africa for the epoch July 1, 1913. The results at about 700 stations have been reduced to the epoch from observations at about forty repeat stations fairly distributed over the greater part of the region. The greater number of the observations was made in 1903 and 1909. The westerly declination has decreased in the ten years 1903–13 by about 1½° in the west, and 2° in the east. In the same period the southerly dip has increased by approximately 1° in the east and 1½° in the west.—I. B. Pole **Evans**: Descriptions of some new aloes from the Transvaal.—J. T. **Morrison**: A new harmonic analyser.

BOOKS RECEIVED.

First-year Mathematics for Secondary Schools. By E. R. Breslich. Pp. xxiv+344. (Chicago: University of Chicago Press; London: Cambridge University Press.) 4*s*. net.

The Theory of Valency. By Dr. J. Newton Friend. Second edition. Pp. xiv+192. (London: Longmans and Co.) 5*s*. net.